ABSTRACT

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The hypotheses were tested that internals and externals would not differ in amount of information-seeking in situations in which their degree of control over their outcomes was clear-cut, but that internals would seek more information than externals in situations in which their degree of control was less clear-cut.

Ten internals and ten externals were compared in each of three conditions of situational control (High, Moderate, and Low). Subjects were led to believe that the study concerned the relative efficiency of human and computer decision-making. High Control subjects were told that whether they had to return for a second experiment depended on their own score on a prediction task, and Low Control subjects were told that those who had to return would be randomly selected. Moderate Control subjects were told that their score, plus that of two other subjects, determined whether they had to return. The main dependent measure was the number of information cards related to the prediction task requested from an Information Checklist.

Internals and externals did not differ significantly on the cards-requested measure in the High and Low Control conditions. Internals

requested significantly more cards than externals in the Moderate Control condition. A third hypothesis, that all subjects in High Control would request more cards than those in Low Control, was not supported. It was concluded that these results provided general support for the importance of situational variables in information-seeking in internals and externals.

INFORMATION-SEEKING AS A FUNCTION OF LOCUS OF CONTROL AND SITUATIONAL CONTROL

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INTRODUCTION

There is currently a good deal of interest in concepts which concern the degree to which an individual believes he has control over his outcomes in a given situation, and the effect of these beliefs on his behavior in that situation. One such concept, developed extensively in the social learning theory of Rotter (1954, 1966), is locus of control. According to Rotter's theory, there were predictable behavioral differences between "internals," having the generalized expectancy that their outcomes are under their own control, and "externals," who believe their outcomes to be largely dependent upon forces beyond their control, such as luck or chance. Rotter (1966) presented the scale he developed to assess this generalized expectancy for locus of control. Briefly, the scale consisted of 29 forced-choice items, 6 of which were "dummy" items. In each case, the individual had a choice between an item reflecting internal control and one reflecting external control. The score was the number of external items an individual chose.

Research with the internal-external dimension has been evaluated in two extensive reviews, by Lefcourt (1966) and Joe (1971), and has generally supported hypotheses derived from the construct (see Appendix A).

According to Rotter (1966), the most important data bearing on the construct validity of locus of control concern the extent to which

a person attempts to control his own environment. Internals, believing that they can control their outcomes, should make more active attempts at controlling their environment than externals. Gore and Rotter (1963) provided some support for this hypothesis. In a survey of black college students, those who had made commitments for civil rights activities were more internal, according to scores on Rotter's scale, than those who had not.

Several studies have examined attempts to control the environment in terms of information-seeking. Again, internals should be more inclined than externals to seek information which might be useful in controlling their outcomes. Seeman and Evans (1962) found that internals in a tuberculosis hospital scored significantly better than externals on a true-false questionnaire about tuberculosis. Seeman (1963) compared internal and external inmates in a reformatory school with respect to knowledge about the immediate situation in the reformatory and parole-relavant information which would help them upon leaving. He predicted little difference in the amount of information internals and externals would have about the immediate situation, as this was not especially relevant to controlling their later outcomes; but he believed that larger differences would appear regarding parole-relavent information. These hypotheses were also confirmed. The results from these ex post facto studies, then, tended to support the hypothesis

that internals will have more information which might be relevant to controlling their outcomes.

In addition to the hypothesis that internals would seek more information than externals, Davis and Phares (1967) examined the situational nature of this effect. Rotter (1966) had suggested that generalized expectancy for locus of control was less important when a specific situation was clearly skill or chance. Cues in a given situation (such as "skill" or "chance" experimental instructions) provide information concerning the extent to which one's outcomes depend on one's behavior. When the specific cues indicate clearly that one's behavior determines one's outcomes, a generalized expectancy that outcomes are beyond one's control simply does not persist, and the behavior of externals should not differ from that of internals. When the situational cues clearly indicate that one's outcomes are the result of chance, the generalized expectancy of internals that they control their outcomes likewise does not persist. In a sense, then, the generalized expectancy is important where no clear-cut "situational expectancy" is established. Davis and Phares (1967) recorded the number of written questions subjects asked about a person they believed they were to attempt to influence in an attitude-change situation. When instructed that success in changing attitudes depended on a chance combination of factors ("chance" condition), internals and externals did not differ in number of questions

asked. When given no special instructions ("ambiguous" condition), internals, as predicted, requested significantly more information than externals. With instructions that success depended on personal skill in attitude change ("skill" condition), internals again requested more information than externals. Finally, Davis and Phares (1967) predicted that all subjects in the "skill" condition would request more information than those in the "chance" condition, though this hypothesis was confirmed only for internals. These results, then, lend support to the hypothesis that information-seeking in internals and externals depends on situational influences.

The purpose of the present study was to provide a further test of information-seeking in internals and externals under different situational conditions. In the Davis and Phares (1967) study, "skill" and "chance" instructions were used to introduce situational differences. They did not report the use of a post-experimental inquiry, however, and it seems possible that at least some of the subjects may not have perceived the situation consistently with the situation in which they were presumably placed. If, for instance, externals in the "skill" condition did not believe the instructions, this could account for their seeking less information than internals in that condition. In the present study, the situation was varied in terms of the degree to which subjects' performance on a task could influence whether they had to return for

a second experiment, rather than attempting to influence their perception of the task. In the High Control condition, having to return for the second experiment depended on the subject's own task score. In the Low Control condition, having to return was unrelated to task performance. In Moderate Control, the second experiment depended on the subject's score plus that of two other subjects. A post-experimental inquiry was added to determine the extent to which subjects perceived their degree of control in these situations as intended. It was expected that the addition of an explicit contingency (having to be in a second experiment if performance did not reach a given criterion) would strengthen the situation effect.

It was predicted that internals and externals would not differ in situations in which their degree of control was clear-cut (High and Low Control), but that internals would request significantly more information than externals if their degree of control was not so clear-cut (Moderate Control). It was further predicted that all subjects in the High Control condition would request more information than those in Low Control. The Low Control condition also provided an index of the degree to which subjects were motivated by the task alone, because having to come back for a second experiment was totally independent of task performance.

METHOD

Subjects

Subjects participated in partial fulfillment of the requirements for their introductory psychology course at the University of North Carolina at Greensboro. On the first day of class, Rotter's (1966) scale was administered to 182 students in 4 sections of the course. Females having the 45 highest (external) and the 45 lowest (internal) scores made up the original subject pool. From these, 30 subjects were used from each end of the distribution. The mean I-E score was 16.4 for the external group (from the upper 21% of the distribution) and 6.2 for the internal group (from the lower 20%).

Subjects were contacted by telephone and told that the experiment would involve "at least one, and possibly two" sessions of reading some material and filling out questionnaires. Subjects were randomly assigned to conditions with the restriction of an equal number of subjects in each cell. This procedure resulted in 10 internals and 10 externals in each of the 3 levels of Situational Control. This assignment procedure was carried out several days before the subjects' appointments so that the experimenter would be unaware of their I-E classification during the session. In all, 65 subjects were used. Data from 5 subjects (3 externals and 2 internals) were dropped when they indicated during the debriefing that they did not believe the

instructions they had been given. These subjects were replaced with subjects from the original subject pool.

Procedure

Sessions were conducted in a small conference room in the psychology department, and each subject participated individually. Subjects were read a standard explanation of the experiment (see Appendix B), with the only differences being in the introduction of the Situational Control conditions.

Subjects were told that their task would be to make predictions concerning the success of a person in a variety of jobs and that their predictions would later be combined with those of 2 other subjects who would also make predictions about the same person. To aid them in their predictions, subjects were given an Information Checklist (see Appendix C) which contained a list of the available bits of information (background, education, etc.) about the person whose success they were to predict. Scoring would be carried out by comparing the predictions made by the subjects to a record of how the person in question had actually performed on the job.

The actual instructions for the 3 levels of Situational Control were as follows:

> HIGH CONTROL: "We will use subjects from this experiment who fail to reach a certain level of accuracy in their predictions, so we can explore factors leading to inaccurate predictions. What this means to you is that, if you reach

90% accuracy or above with your predictions, there will be no need for you to come back for the second experiment. If your score is less than 90%, you will be required to participate in this next experiment in order to receive your experimental credit. I should point out that this depends on your own accuracy score and not the average score for your group."

MODERATE CONTROL: "We will use subjects from this experiment who fail to reach a certain level of accuracy in their predictions, so we can explore factors leading to inaccurate predictions. As I told you earlier, your predictions will be averaged with those of 2 other subjects and these averaged predictions will be scored for accuracy. What this means to you is that if your group's score reaches 90% accuracy or above, there will be no need for you to come back. If your group's score is less than 90%, you will each be required to participate, again separately, in order to receive your experimental credit."

LOW CONTROL: "We will randomly select subjects from this experiment to be in another experiment which will explore factors leading to inaccurate predictions. What this means to you is that, if your name is drawn, you will be required to participate in this next experiment in order to receive your experimental credit."

At this point, the experimenter presented the Information Checklist and told the subject she had 3 minutes to look it over and decide what information she wanted to use in making her predictions. The experimenter left the room while the subject checked the cards she wanted. At the end of 3 minutes, the experimenter collected the Information Checklist and asked the subject to fill out a "Research Evaluation" (see Appendix D) while he went to get the task materials. The Research Evaluation embodied an item on which subjects rated (from 0 to 30) the extent to which their score on the task affected whether or not they had to return for the second experiment (a check

on the Situational Control manipulation), and a rating of the degree to which information-seeking affected their accuracy on the task. Other items concerned the clarity of the instructions and asked the subject to briefly describe the purpose of the experiment.

When the subject completed this form, the experimenter returned and fully explained the purpose of the experiment. Inquiry was also made into whether the subject believed the earlier deception.

RESULTS

A 2 x 3 analysis of variance was performed on the I-E scores of the 6 groups (Winer, 1971). The mean external score of 16.4 was significantly greater than the mean score of 6.2 for the internal group ($F = 566.3$, $df = 1/54$, $p < .01$). Neither the main effect for Situational Control nor the I-E Situation interaction was significant. The summary of this analysis is presented in Table 1. A simple effects analysis revealed that the mean internal scores did not differ significantly across the 3 levels of Situational Control. Likewise, the mean external scores did not differ across Situational Control.

The primary dependent variable was the number of information cards each subject requested. Means and standard deviations for this measure are presented in Table 2. Davis and Phares (1967) found a tendency for the means and variances to be related and performed a square-root transformation. The same tendency was noted in the present experiment, and a square-root transformation was performed (Winer, 1971). Means and standard deviations for the transformed data are presented in Table 3.

Since specific directional hypotheses were made, five a priori planned comparisons were performed on the transformed data (Edwards, 1968). In the High Control condition, the mean number of cards requested by internals (3.13) and by externals (3.24) did not differ significantly.

TABLE 1

VARIANCE ANALYSIS SUMMARY FOR
INTERNAL-EXTERNAL SCORES

Source	df	MS	F
Situational Control (A)	2	1.82	.64
Locus of Control (B)	1	1591.35	566.30*
A x B	2	.65	.23
Error	54	2.81	

*p < .01

TABLE 2

MEANS AND STANDARD DEVIATIONS FOR CARDS REQUESTED: RAW DATA

	HIGH CONTROL		LOW CONTROL		MODERATE CONTROL	
	I	E	I	E	I	E
Mean	10.0	10.7	11.4	7.7	9.9	9.5
Standard Deviation	2.88	3.10	3.26	2.32	3.08	3.44

TABLE 3

MEANS AND STANDARD DEVIATIONS FOR CARDS REQUESTED: SQUARE ROOT TRANSFORMATIONS

	HIGH CONTROL		LOW CONTROL		MODERATE CONTROL	
	I	E	I	E	I	E
Mean	3.13	3.24	3.34	2.75	3.11	3.03
Standard Deviation	.21	.24	.22	.16	.26	.31

Also, the means for internals (3.11) and for externals (3.03) did not differ significantly in the Low Control condition. In the Moderate Control condition, however, the mean number of cards requested by internals (3.34) was significantly greater than the mean for externals (2.75; $f = 6.76$, $df = 1/54$, $p < .025$). The comparison between all subjects in the High Control condition (mean = 3.18) and those in Low Control (mean = 3.12) was nonsignificant, as was the comparison between the High and Moderate (mean = 3.04) Control groups. The summary of all 5 comparisons is presented in Table 4. A sixth comparison, though not orthogonal, was carried out on the means for all subjects in the Moderate and Low Control groups. These means were also not significantly different.

Preliminary evaluation of the post-experimental inquiry indicated that many subjects did not understand the wording of the first item, a rating of the degree to which participation in the second experiment was contingent on the subjects' score on the task. Conversation with subjects confirmed this, so the item was modified during the course of the experiment. The ratings of internals and externals on this revised item were combined in each of the 3 levels of Situational Control, and an analysis of variance for unequal n was performed (Winer, 1971). This analysis revealed that the ratings were significantly different for the 3 groups ($F = 34.34$, $df = 2/35$, $p < .01$). The summary of this

TABLE 4

SUMMARY OF ANALYSIS OF A PRIORI PLANNED COMPARISONS

Source	df	MS	F
I and E (Moderate)	1	1.76	6.76*
I and E (High)	1	.06	.23
I and E (Low)	1	.03	.12
High versus Low	1	.12	.46
High versus Moderate	1	.18	.69
Error	54	14.70	.26

*$p < .025$

analysis is presented in Table 5. A Newman-Keuls analysis revealed that the mean ratings in the High Control (25.0, n = 13) and in the Moderate Control (24.3, n = 12), conditions were both significantly higher than the Low Control mean of 7.4 ($n = 13$, $p < .01$ for both differences). The ratings in the High and Moderate Control conditions did not differ significantly.

An analysis of variance was performed on the ratings for the second item of the post experimental inquiry, regarding the extent to which subjects perceived information as affecting their score on the task. Interestingly, the mean ratings of internals (20.9) and externals (19.0) did not differ significantly. The summary of this analysis is presented in Table 6.

TABLE 5

SUMMARY OF ANALYSIS OF POST-EXPERIMENTAL RATINGS: ITEM 1 (REVISED)

Source	df	MS	F
Treatments	2	1269.21	34.34*
Error	35	36.96	

*$p < .01$

TABLE 6

SUMMARY OF ANALYSIS FOR POST-EXPERIMENTAL RATINGS: ITEM 2

Source	df	MS	F
Situational Control (A)	2	59.85	1.85
Locus of Control (B)	1	52.30	1.86
A x B	2	14.10	.43
Error	54	32.07	

DISCUSSION

The a priori comparisons lend some support to the importance of situational variables in the information-seeking in internals and externals. They did not differ in conditions in which their performance on the task either totally determined their outcome (High Control) or did not affect their outcome at all (Low Control). In the Moderate Control condition, however, in which subjects' degree of control is less clear, internals, as predicted, requested more information than externals. This latter finding, however, must be interpreted in light of the post-experimental ratings of the degree to which subjects perceived their score on the task as influencing whether they had to return for the second experiment. Because this item was revised during the course of the experiment, the individual cell n's were too small to allow reliable comparisons between internals and externals in each condition, and their ratings were combined. The combined ratings indicated no difference between High and Moderate Control subjects in the degree to which they perceived their score as influencing their outcome. If these ratings are accepted as accurate reflections of the subjects' perceptions, then it is difficult to interpret the finding that externals requested fewer cards than internals in the Moderate Control condition, but not in High Control. One possibility is that, in the Moderate Control condition, there was some motivational effect of having

one's outcomes influenced by two other people, though there is insufficient data to assess this possibility. Another explanation could be the possible reluctance of subjects to make extreme ratings on the scale. In the Low Control condition, in which subjects were told that those having to return would be randomly selected (i.e., no relation between their task score and the second experiment), the mean rating was still 7.4. In High Control, it is possible that there was some reluctance to choose the extreme rating (30), even though subjects were told that their own score determined whether they had to return. If this possibility is accepted, then the finding of no differences in the ratings of High and Moderate Control subjects could be explained as an artifact of "suppressed" ratings in High Control. Again, there is insufficient data to make a statement with any certainty about these possibilities. These findings do suggest, however, that the perceptions of internals and externals of the contingency between their behavior and their outcome in various situations is, in itself, a potentially profitable line of research.

Specific comparisons between the present study and that of Davis and Phares (1967) are difficult since the latter attempted to manipulate the subject's perception of the task, and the present study manipulated the degree to which the subject's performance could affect her outcome. Generally, however, both experiments were dealing

with interactions between a generalized expectancy for locus of control and situation-specific influences, and some tentative comparisons are possible. Davis and Phares found no differences in information-seeking in internals and externals when the situation clearly indicated that outcomes were not contingent on performance ("chance" instructions). These results were consistent with the finding in the present study of no differences in the Low Control condition. Davis and Phares found more information requested by internals than by externals when the situational cues were less clear-cut ("ambiguous" instructions). In the Moderate Control condition of the present study, subjects were led to believe that their score was only one of three that would determine their outcome. In a sense, then, the inputs of the other two scores were unknown, or ambiguous, and internals in the present study requested more information than externals. This latter finding is to be interpreted with some caution, however, in light of the earlier discussion of the post-experimental inquiry. When subjects were given "skill" instructions (implying that their outcome depended on their performance in the situation), Davis and Phares found that internals requested more information than externals. This finding was not consistent with the finding in the present study of no differences between internals and externals when their own performance determined their outcome

(High Control). Of course, it is possible that externals receiving "skill" instructions in the Davis and Phares study did not actually perceive the task as a skilled one, though the lack of a reported post-experimental inquiry leaves this question open. The present study, then, suggested that externals will not differ from internals in the amount of information-seeking when the relationship between their performance and their outcome is explicitly clear, and when they also perceive the relationship between information-seeking and success in the same manner as internals.

Again, the above comparisons between the study by Davis and Phares and the present one must necessarily be tentative due to differences in tasks and in methods used to vary the situation. Taken generally, however, it appears that both studies provide evidence for the importance of situational variables in examining internal-external differences in information-seeking. The finding in the present study that internals and externals made similar ratings of the effect of information-seeking on their accuracy in the task points up the importance of employing post-experimental inquiries to evaluate subjects' perceptions of the task. This variable had some importance in the present study, in which situation was varied in terms of how much one's performance influenced one's outcomes; but it becomes critical in studies using skill and chance instructions to manipulate the situational context.

The present study did fail, however, to demonstrate differences in information-seeking between subjects in situations in which their performance is directly related to their outcome (High Control) and those in situations in which performance and outcome are unrelated (Low Control). It was assumed that the contingency of a possible second experiment would help to motivate subjects and, thus, strengthen the situation effect. During debriefing, however, fifteen subjects were questioned about this contingency, and all revealed that they would not have minded returning for a second experiment. If this feeling was fairly widespread, it could possibly have contributed to the failure to find a difference between the High and Low Control groups, inasmuch as subjects in the High Control condition, even though their own performance determined their outcomes, might not have been as motivated as was expected to avoid the second experiment. It seems unlikely that the failure to find a difference between the High and Low Control conditions can be attributed to failure by the subjects to perceive accurately the relationship between their behavior and their outcomes, because the post-experimental check on this manipulation revealed that subjects did perceive these contingencies as intended. It seems, however, that the predicted difference might be found where the outcome is highly positive or negative for the subjects. Another interesting variable to be investigated is the effortfulness or response-cost of

information-seeking. In both the present study and in the one by Davis and Phares (1967), subjects had only to write down questions or check off the information they wanted. If some degree of response-cost or effort were involved in information-seeking, differences between internals and externals might become more clear-cut.

SUMMARY

The importance of situational variables in information-seeking in internals and externals was examined. In High and Low Control conditions, in which subjects had a clear-cut degree of control over having to come back for a second experiment, internals and externals did not differ in information-seeking. In the Moderate Control condition, in which having to come back for a second experiment depended partly upon the performance of others, internals requested significantly more information than externals. These results were interpreted as lending support to the importance of situational variables in information-seeking in internals and externals.

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APPENDIX A

Literature Review

Rotter (1954) has presented a social learning theory utilizing the constructs of behavior potential, expectancy, and reinforcement value as theoretical bases from which to predict behavior. In a later monograph (Rotter, 1966), he elaborated the construct of "expectancy" and introduced his scale for measuring generalized expectancy for locus of control. Briefly, the dimension of "locus of control (LC)" concerns the general extent of an individual's expectancy that he is in control of his outcomes. A great deal of research has been done testing predictions from this dimension in a variety of areas, and particularly relevant findings have been summarized in extensive reviews by Lefcourt (1966) and Joe (1971). The present paper is concerned with the theoretical importance of this dimension for experimental and applied work with humans. After a review of the locus of control dimension and early work regarding its construct validity, possible extensions into applied areas will be considered.

According to Rotter (1966), the effect of a reinforcement following a human subject's behavior depends on the subject's perception of the reinforcement as a consequence of his behavior. Hence, the person may perceive the reward as following his behavior in time, but may not necessarily see the reward as actually contingent on his behavior. In other words, the person may attribute the outcome to forces beyond his control such as luck or the influence of other people. In such a

case, the person displays a belief in external control. One who believes that outcomes are the result of his own behavior, then, displays a belief in internal control. It is important to note that, in the following discussion, the LC dimension is one of generalized expectancies measured by Rotter's Locus of Control Scale, not of personality types. Hence, the terms "internal" or "external" refer to scores falling in a given range of Rotter's scale.

If these beliefs, or expectancies, are an important variable in a subject's behavior, and if a scale sampling the extent of these beliefs can be related to actual performance, there are important implications for human learning. Rotter (1966) suggests that when a person perceives a reward as actually contingent upon his behavior (internal control), the reward will have the effect of strengthening the potential for that behavior to recur. The weakening of behavior potential following a negative consequence likewise depends upon the person's perception of a causal relationship between his behavior and the outcome. If, however, the person perceives the consequences of a behavior as beyond his control (external control), then consequences are less likely to strengthen or weaken the potential for that behavior to recur.

It is suggested that these beliefs are a product of a person's reinforcement history. A student who has often studied for quizzes and found that his grades were not strongly related to his effort or

mastery of material but, rather, depended on how questions were asked, how they were graded, and so forth, would theoretically be more prone to "external control" beliefs regarding quizzes than one who has often found his grade to be relatively proportional to his effort. Rotter notes that many other variables may enter into the determination of actual performance. The problem here, then, will be whether knowledge of a person's generalized expectancies concerning the control of his outcomes is potentially useful in predicting and modifying his behavior.

The scale most often used to assess these generalized expectancies is Rotter's Internal-External Scale, containing 29 forced-choice items, 6 of which are "dummy" items. The test is presented as a scale of personal beliefs (no right or wrong), and the score is the number of external items the person chooses from each pair. The scale was factor-analyzed from a much larger pool, and items which had a high correlation with such tests as the Marlowe-Crowne Social Desirability Scale, were withdrawn.

Internal consistency data are as follows: .73 split-half reliability with introductory psychology students at Ohio State ($n = 100$); the Kuder-Richardson value for another group of psychology students was .70 ($n = 400$), and the Kuder-Richardson value for a national stratified sample of high school students ($n = 1,000$) was .69. Test-retest reliability (again psychology students) was .72 at one month ($n = 60$) and .55 at two months ($n = 117$).

Rotter (1966) interprets the low split-half value by suggesting that the items are not really comparable, and the low two-month test-retest value by suggesting that the first administration was in a group setting and the second in an individual setting.

Hence, the scale has a moderate degree of reliability, and one may now consider how well the scale relates to actual behavior.

In studies of complex learning, Phares (1957) found that if a subject is told that performance on a task is basically due to chance, reinforcement (actually a fixed order of "right" or "wrong" feedback) produces smaller increments or decrements in a subject's betting behavior than if he is told that performance depends on his skill at the task. Rotter (1966) reports that James (1957) used an early version of the LC scale in an unpublished dissertation, and found that reinforcement again had less effect on the behavior of subjects classified as externals.

Rotter (1966) has indicated that the most important data bearing on the construct validity of the LC dimension is in the degree to which internals and externals attempt to manipulate or control their own environment. Internals, viewing their outcomes as contingent upon their own behavior, should show more active striving to affect their outcomes. Externals, believing that outcomes are determined more by uncontrollable forces than by their own behavior, should be less inclined to attempt to control their outcomes.

Using the degree of information-seeking in a given situation as one indicator of a person's efforts to control his outcomes in that situation, several studies have compared information-seeking in internals and externals. Seeman and Evans (1962) administered the Rotter scale to tuberculosis patients and found that internals scored significantly higher than externals on a questionnaire about tuberculosis. Furthermore, internals were rated as knowing more about their condition, as questioning doctors and nurses more, and as less satisfied with the amount of feedback they could receive. Seeman (1963) also found that internals in a reformatory school had more information relevant to parole regulations and facts which might help them after they left the reformatory than did externals.

The above field studies provide general support for the hypothesis that internals would be more active than externals in seeking information relevant to controlling their outcomes. In a more tightly controlled experimental test of this hypothesis, Davis and Phares (1967) found that internals requested more information than externals about a person when they believed that they were to attempt to change that person's attitudes about the Viet Nam war. (They further found a tendency for this effect to depend partly upon specific experimental instructions regarding the "skill" versus "chance" nature of attitude change.)

Finally, Gore and Rotter (1963) found, in a survey of black college students, that those who had made summer commitments for civil

rights activities and protests were significantly more internal than those who had not, again offering some support for the hypothesis that internals would make more active attempts to influence their own environment than externals.

An especially interesting area of LC research, bearing both on the construct validity of the dimension and on its possible relevance in applied psychology, deals with the relationship between LC scores and personality or clinical variables.

Williams and Nickels (1969) correlated Rotter's LC scale with Farberow and Devries' MMPI suicide scale (MMPIS) and with Devries' Potential Suicide Personality Inventory (PSPI). The PSPI was positively correlated with LC for females only ($r = .18$, $p < .05$, $N = 121$). The MMPIS was positively correlated with LC for both males and females (males: $r = .25$, $p < .01$, $N = 114$; females: $r = .18$, $p < .05$, $N = 121$). Similarly, Abramowitz (1969) found that externality correlated positively with the Guilford Depression Scale, even when effects of social desirability were partialled out ($r = .282$, $p < .05$, $N = 69$). Hence, there is suggestive evidence linking highly external scores with a greater tendency toward depression and suicide, which would be expected from the LC construct. The relationship between LC and maladjustment is still far from clear, however. It would seem on a priori grounds, for instance, that extreme internality in the face of overwhelming odds

could lead to considerable difficulty and self-blame. Research comparing the adaptiveness of internal or external attitudes in various situations would present a clearer picture of the relationship between LC and adjustment.

Hersche and Scheibe (1967) administered the Rotter LC scale, the California Psychological Inventory, and the Adjective Checklist to undergraduates and found that internals were higher on CPI scales of Dominance, Intellectual Efficiency, Well-Being, and others generally indicating good adjustment. On the ACL, internals were higher on such scales as Achievement, Endurance, and Order. These results were generally consistent with expectations from the LC construct. Hersche and Scheibe pointed out the interesting finding, however, that the externals showed more variability and apparently were less homogenous than the internal sample. This latter finding again supported the need for more refined research delineating the relationship between LC and indices of adjustment.

Finally, Shybut (1968) compared normals with moderately and severely disturbed patients and found that the more severely disturbed patients had significantly higher external scores than moderately disturbed patients or normals. Since the severely disturbed group had much longer durations of hospitalization, however, the higher external scores might have reflected the influences of hospitalization upon control attitudes.

Of course, it is not possible to make cause-effect inferences concerning the relationship between control attitudes and adjustment on the basis of these studies. One possibility is that the same factors influencing degree of adjustment also influence control attitudes. In general, however, the above studies provided support for hypotheses derived from the LC construct.

With regard to LC in actual therapeutic situations, several interesting and promising studies have been presented. Jacobson (1971) found that, given a choice between descriptions of therapists (ranging from "ego" psychology to behavioral therapy) and instructed to indicate which they would prefer if they were having difficulties, externals chose behavioral therapy significantly more than internals. This finding would be expected inasmuch as internals would theoretically prefer emphasis on ego control, whereas externals would believe that more active outside influences would be needed to modify their behavior. It is unfortunate that an option not to seek therapeutic aid was not included. If seeking therapy can be seen as an attempt to, in a sense, control one's outcomes, it might be that internals would show a greater overall tendency to seek therapy.

Before considering the possible relevance of the above findings for applied work, it would be well to consider some work which has been done regarding shifts in LC scores as a function of environmental

events. As LC is theoretically dependent on one's experience with controllable and uncontrollable forces, shifts in LC would be expected to depend on the nature of the intervening events. Pursuing this logic, MacArthur (1970) found a significant shift toward externality in the LC scores of college males affected by a draft lottery, with no change occurring for those who were unaffected. Similarly, Gorman (1968) found a shift toward externality in the scores of college students after the 1968 Democratic Convention, presumably because most of the students had supported McCarthy's unsuccessful attempt to receive the nomination. Also, Gottesfeld and Dozier (1966) found that workers having been trained to participate in a community action program had more internal scores than workers just beginning their training.

The above studies supported the contention that LC fluctuations depend to some degree on experienced control. With respect to LC changes during therapy, Smith (1970) found significant changes toward internality in the mean LC scores of "post-crisis" patients. No such changes occurred for "non-crisis" controls. Gillis and Jessor (1970) reported that patients who were rated as more improved after therapy showed greater LC shifts toward internality than patients not rated as improved. Dua (1970) compared LC shifts as a function of the nature of therapeutic intervention, comparing an action-oriented therapy (similar to behavioral rehearsal) with a reeducational approach (changing

attitudes) in improving the interaction of clients with specific persons. Both approaches resulted in shifts toward internality, as compared to a no-treatment control, but the greater shift occurred after the action-oriented therapy. In a direct attempt to modify LC scores, Coven (1970) reported that verbal-reinforcement therapy was superior to client-centered therapy in producing shifts toward internality.

Again, these data supported the contention that LC scores vary as a function of environmental events. From the studies directly involving LC and therapy, it appears that, first, improvement in therapy is associated with changes toward internality and, second, that different types of therapy vary in producing these changes.

Given the above findings, several areas for empirical examination become apparent. Jacobson's (1971) and Dua's (1970) findings suggest the possibility that internals and externals might show different rates of improvement as a function of the type of therapy they received. For example, groups of internals and externals (having the same target behavior) could be compared in treatments having a high degree of therapist control versus treatments in which the therapist is less active in structuring the situation. Using this approach, rates of improvement as well as LC shifts could be compared. Research of this type could be relevant for arguments concerning the relative efficacy of different approaches to treatment. It may well be that

individual characteristics of clients, such as control attitudes, may influence the type of therapy they are better suited for.

Another area relevant for general behavior theory as well as therapeutic effectiveness concerns the interaction of cognitive variables (such as control attitudes) and overt behavior. To show that LC changes in therapy does not resolve the question of whether overt behavioral changes meet with consequences which change LC, or whether directly influencing control attitudes leads to corresponding changes in overt behavior. One possible approach to these questions would be to use a therapy specifically oriented toward changing LC and a therapy oriented toward overt behavioral change, and then to compare shifts in LC and overt behavior in controlled situations.

Of course, any research in the LC area faces certain difficulties. First, there is the assumption that some relatively stable and generalized expectancy for reinforcement actually exists and that it influences behavior to some degree. Even in Rotter's theory of social learning, this expectancy is only one of several variables determining behavior (Rotter, 1954). Its effect, then, is presumably relatively small.

The second problem concerns the measurement of this dimension. Despite the large number of studies finding expected differences between internals and externals, some questions have been raised concerning the nature of the control attitudes actually sampled by the scale.

Gurin, Gurin, Lao, and Beatty (1969) factor-analyzed the responses of a group of Negro youth on the Rotter scale (extended to include more race-relevant items) and found four factors. The first factor dealt with Personal Control and with specific beliefs concerning control of one's own life. The second factor, Control Ideology, was more general, reflecting the degree to which most people in the society could control their lives. The other two factors, System Modifiability and Individual-System Blame, concerned the extent to which politics in the system can be controlled, and the tendency for the individual to blame himself versus a blaming faulty system for his condition.

Mirels (1970) performed a factor-analysis of responses of college students on the unextended Rotter scale. Varimax rotation revealed two factors, one dealing with one's perceived control over his own life, and one dealing with an individual's capacity to influence political affairs.

These studies, then, raise considerable question as to the unidimensionality of locus of control. It is entirely possible for an individual to perceive himself as controlling his personal outcomes while at the same time perceiving the political system as beyond the control of the average citizen. To the extent that both categories of attitudes are sampled and combined into one score, attempts to predict behavior from that score are weakened. The multidimensional quality of the

LC dimension *per se* (as measured by Rotter's scale), of course, does not reduce its potential importance as a determinant of behavior. In fact, extension and development of the scale to measure directly and separately several categories of control attitudes would enable researchers to narrow the range of attitudes affecting their results and, thus, to reduce error in experimentation. As yet, no attempts to refine the Rotter scale in such a manner have been reported, but the necessity for such work seems clear.

Since Rotter's original monograph in 1966, a good deal of research using the scale has been presented. Results have generally supported the validity of the LC construct and the scale in a variety of areas. The construct itself seems to be useful in explaining some differences in overt behavior, and provides one avenue of research concerning the interaction of cognitive variables and overt behavior. The factor-analytic studies of Rotter's scale, however, suggest that the notion of a "generalized expectancy" for locus of control should be refined to include several sets of control attitudes which may vary independently. The development of a scale to measure these different sets of attitudes could perhaps prove valuable for behavioral research.

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APPENDIX B

Experimental Instructions

"The experiment in which you are about to participate is co-sponsored by the Department of Psychology and the School of Business. In both psychology and business, we are often concerned with the prediction of people's behavior in certain situations, such as work, for instance. We are often faced with decisions as to whether to employ a certain person, or in what capacity he should be employed. These decisions are usually based on biographical information, interviews, and the results of various tests taken by the prospective employee. Of course, we are concerned with decision-making methods and types of information that lead to the most reliable predictions concerning success in some jobs. Recently, some schools of business have begun experimenting with the use of computers to analyze test scores and other types of information. In essence, the computer, given several choices for filling a certain job, can make fairly reliable predictions concerning who will perform best at that job. Of course, there are some problems in using computers in this manner. In addition to the expense of programming and use, computers, unlike human interviewers, cannot make use of information which is not in the form of test scores, such as an impression obtained in an interview. Briefly, what we hope to do in this experiment is to compare the success of people in a decision-making situation against that of a computer.

"Here is how we will do this. By going through past records of the university and by using interview and questionnaire data from past

experiments, we have collected information profiles of a person who attended this university 2 - 2 1/2 years ago. What we will ask you to do shortly is very simple. We want you to act as if you were in the personnel department of some company. You will have access to the information concerning the background and performance of the person while at UNC-G, as would someone actually interviewing this person for a job. I will give you a set of questions about how you would rate the person with respect to what jobs he would be suited for, how well he would perform at those jobs, and so forth. After those of us in the psychology department finish this part of the experiment, our colleagues in the school of business will use a computer to analyze the information it can work with and attempt to make the same types of decisions you and others will be making. Now, with the help of the placement office, we have recently followed up the person about whom you decisions will be made. By interviewing him and people close to him, such as supervisors and co-workers, we have information about how he actually is performing presently. Since we have this follow-up information, we can compare the accuracy of the predictions, if you will, of people such as yourself to that of a computer.

"Before we begin the task, I should tell you that your predictions will be combined with those of two other subjects who will make predictions about this same person. You will not actually meet or work with

the two other people, we simply combine your predictions. Here, we are simply examining the possibility that by combining the predictions of several people, some of the errors may average out. In other words, several people might interview the same person independently and make independent predictions, which could later be averaged. Though more time-consuming, these averaged predictions might be more accurate than single predictions, and would present an inexpensive alternative to the use of computers."

At this point, the instructions for each of the control conditions were presented as follows:

HIGH CONTROL: "We will use subjects from this experiment who fail to reach a certain level of accuracy in their predictions, so we can explore factors leading to inaccurate predictions. What this means to you is that, if you reach 90% accuracy or above with your predictions, there will be no need for you to come back for the second experiment. If your score is less than 90%, you will be required to participate in this next experiment in order to receive your experimental credit. I should point out that this depends on your own accuracy score and not the average score for your group."

MODERATE CONTROL: "We will use subjects from this experiment who fail to reach a certain level of accuracy in their predictions, so we can explore factors leading to inaccurate predictions. As I

told you earlier, your predictions will be averaged with those of two other subjects and these averaged predictions will be scored for accuracy. What this means to you is that if your group's score reaches 90% accuracy or above, there will be no need for you to come back. If your group's score is less than 90%, you will each be required to participate, again separately, in order to receive your experimental credit."

LOW CONTROL: "We will randomly select subjects from this experiment to be in another experiment which will explore factors leading to inaccurate predictions. What this means to you is that, if your name is drawn, you will be required to participate in this next experiment in order to receive your experimental credit."

APPENDIX C

Information Checklist

Each bit of personal information is contained on a numbered index card. Circle the number for each card you wish to use in making your decisions.

Card Number:	Information Contained
1.	Score on Wechsler Adult Intelligence Scale (with brief interpretation).
2.	Results of Strong Vocational Interest Blank (with brief interpretation).
3.	Social background of family (salaries of father and mother; occupations.
4.	Major area of study at UNC-G.
5.	Schools other than UNC-G attended.
6.	Last three books read completely.
7.	Magazines and newspapers subscribed to.
8.	Favorite sport.
9.	Whether he/she prefers to play or to watch sports.
10.	Race.
11.	Sex.
12.	Age.
13.	GPA and class rank at time of graduation from UNC-G.
14.	Place of birth.
15.	Personality profile and interpretation from Cattell Personality Inventory.
16.	Political party.

Card Number:	Information Contained
17.	Marital status, number of dependents while at UNC-G.
18.	Organizations he/she belonged to while at UNC-G.
19.	Favorite course taken at UNC-G. Grade in that course.
20.	Average number of cigarettes (if any) smoked per day.
21.	How frequently he/she reports drinking alcoholic beverages.
22.	Whether he/she preferred working on individual or group projects.
23.	Favorite atmosphere for studying.
24.	Jobs (summer or part-time) held. Which ones he/she rated as most and least enjoyable.
25.	Type of car(s) owned while at UNC-G.
26.	Opinion statement on premarital sex.
27.	Opinion statement on legalized marijuana.
28.	Opinion statement on legalized abortion.
29.	Honors obtained in high school.
30.	Honors obtained in college (UNC-G or others).

APPENDIX D

Research Evaluation

The following information will help us in planning our future research. Your answers are anonymous, so feel free to answer candidly.

1. To what extent do you feel that your accuracy or score on the prediction task affects whether or not you have to come back for the second experiment?

0 - - - - - 5 - - - - - 10 - - - - - 15 - - - - - 20 - - - - - 25 - - - - - 30

none at all — very much

2. To what extent do you feel that the amount of information you will have (i.e., the number of cards you requested) increases your accuracy on the prediction task?

0 - - - - - 5 - - - - - 10 - - - - - 15 - - - - - 20 - - - - - 25 - - - - - 30

none at all — very much

3. Briefly, in your own words, what does the experiment seek to examine?

4. Were the instructions clear?